Remarks:

Applicant has carefully studied the non-final Examiner's Action mailed 06/12/2008, having a shortened statutory period for response set to expire 09/12/2008, and all references cited therein. The amendment appearing above and these explanatory remarks are believed to be fully responsive to the Action. Accordingly, this important patent application is now believed to be in condition for allowance.

Applicant responds to the outstanding Action by centered headings and numbered paragraphs that correspond to the centered headings and paragraphing employed by the Office, to ensure full response on the merits to each finding of the Office.

Continued Examination Under 37 CFR 1.114

1. Applicant thanks the Office for entering the submission filed 05/28/2008.

Claim Rejections – 35 USC § 102

2. Applicant acknowledges the quotation of 35 U.S.C. 102(b).

3. Claims 1, 6, 18-27, 30-33 and 36 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Rees. Reconsideration and withdrawal of this ground of rejection is requested.

Rees, in a first embodiment, is a forward-looking system mounted on an airplane that is in flight. More particularly, a laser is mounted on the forward end of a fuselage and said laser is aimed in a forward direction so that unfavorable flying conditions such as weather disturbances or wake vortices in the path of travel of the aircraft can be detected so that the crew of the aircraft can avoid such conditions.

In a second embodiment, the Rees system is ground-mounted at an airport so that the reflected laser beam that may indicate an adverse condition is sent to ground personnel at the airport. The ground personnel can then advise the crew to take appropriate action.

It is therefore important to note that in the first embodiment, no information is carried by the outgoing laser beam transmitted by the laser that is mounted on the forward end of the aircraft. In the second embodiment, no information is carried by the ground-mounted outgoing laser beam. In both embodiments, the laser is unmodulated by communication data and therefore cannot carry communication information. In both Rees embodiments, the transmitter sends an outgoing laser beam to a target that is in line-of-sight communication with the transmitter. In both embodiments, the outgoing laser beam is reflected back to the aircraft (first embodiment) or ground station (second embodiment) by a weather disturbance or wake vortex of the type that

emits a noise. The target that reflects the outgoing laser beam so that it becomes an incoming laser beam must also be in line-of-sight relation with the aircraft (first embodiment) or the ground-based transmitter (second embodiment). There is no disclosure whatever of an outgoing modulated laser beam at a first fixed position that is reflected off trees or the like at a remote second fixed position in line-of-sight relation to the first fixed position toward a third fixed position that is in line-of-sight relation to the second fixed position but not in line-of sight relation to the first fixed position.

In other words, in the Rees system an unmodulated laser beam follows a straight outgoing path of travel from a transmitter to a remote laser-reflecting weather system or wake vortex in line of sight relation to the transmitter and a straight incoming path of travel from the remote reflecting weather system or wake vortex that is also in line of sight relation to the transmitter. The outgoing and incoming paths of travel are essentially the same path in view of the speed of light and the very slow relative speed of the aircraft. Thus, the second embodiment employing a stationary, fixed position transmitter works almost in the same way as the first embodiment. The only significant difference between the two embodiments is a tracking system used in the first embodiment so that the outgoing laser beam can remain trained on a weather system or wake vortex as the aircraft continues to fly. In both embodiments, a laser beam travels a straight path of travel to a target and is reflected essentially straight back along the same path of travel. An observer of the Rees system would thus see what would appear to be a straight line laser beam from the aircraft to a target if observing the first embodiment or a straight line laser beam from a fixed position transmitter to a target if observing the second embodiment.

There is no such straight line in the claimed system. The claimed system necessarily includes a laser beam path of travel having a generally “V” shape. The angle between the two (2) legs of the “V” may vary between a little more than zero degrees (0°) to a little less than one hundred eighty degrees (180°). This fact is obvious in view of the specification and drawings as filed. The specification has been amended to expressly state said “V”-shaped path of travel and such express statement is not new matter in view of said specification and drawings as filed.

Unlike the Rees straight-line path-of-travel system, the claimed system always has an intermediate second fixed position that is in line of sight relation to a first fixed position and a third fixed position that is in line of sight relation to the intermediate second fixed position but where the first and third fixed positions are out of line of sight relation to one another due to a

barrier between them. The first and third fixed positions are the free ends of the "V" and the second intermediate position is the pointed middle of the "V" although the second intermediate position need not be in the exact middle, *i.e.*, it need not be mid-way between the first and second positions and in most applications would rarely be exactly midway between said first and third fixed positions.

The specification is replete with references to a transmitter and a receiver that are remote from one another and not in line of sight relation to one another due to a barrier means therebetween but where the both the transmitter and the receiver are in line of sight relation to a target that is in line of sight relation to both the transmitter and receiver. All of the drawings also depict such relationship.

These facts clearly distinguish the claimed invention from the Rees system. The claimed invention includes modulated (information-carrying) laser light that is transmitted from a stationary first location to a stationary second location that is remote from said first location in line of sight communication therewith. The modulated light bounces from or is reflected from the second location and is detected and demodulated at a third location that is in line of sight relation to the second location but not the first. Information is thus transmitted from the first location to a third location remote from the first location and out of line of sight relation to the first location.

These structural elements of the claimed invention are in sharp contrast to the Rees structural elements. A moving laser having no fixed first position transmits an unmodulated laser beam to a forward location in a first straight path of travel and if a weather disturbance or wake vortex is detected, the laser beam is reflected thereby and returns to the aircraft for analysis along essentially the same straight path of travel. There is no barrier means between the transmitter of the unmodulated laser beam and the remote target and the unmodulated laser beam does not follow a generally "V" shaped path of travel where it bounces off a barrier means between the transmitter and the target weather condition. Depending upon the condition of the reflected laser beam, electronic analysis of the reflected beam can determine if the disturbance is a wind shear or other dangerous condition. The detected disturbance must be in line of sight with the laser mounted on the forward end of the aircraft and when the reflected laser beam travels back to the aircraft for analysis, it follows the same straight path.

Rees clearly neither teaches nor suggests transmittal of a modulated, information-carrying signal from a first fixed position to a second fixed position in line of sight relation to the first fixed position, nor does Rees teach or suggest reflection of said modulated signal from the second fixed position to a third fixed position in line of sight relation to the second position for reception by detecting and demodulating means at said third fixed position which is out of line of sight relation with said first fixed position.

The Office contends that receiver 87 of Rees lies on a different plane than laser 12, as depicted in Fig. 3 of Rees, implying, of course, that the path of travel of the unmodulated Rees laser beam is also "V" shaped. This contention does not include the fact that receiver 87 is positioned inside the fuselage of the aircraft and that the unmodulated laser beam from the Rees laser 12 follows a straight path of travel from the front of the fuselage to target 16a and the same path of travel back to the front of the fuselage. The unmodulated laser beam that has already followed and completed a straight out and a straight back path of travel with no barrier means in said path of travel. Hence said laser beam has not followed a "V"-shaped path of travel. The laser beam, having completed its round trip, is then diverted inside the aircraft by a mirror so that it can impact a charge coupled device and thereafter undergo various electronic analyses. This inside-the-fuselage path of travel neither teaches nor suggests Applicants' structure as claimed in all of the independent claims as currently amended.

The Office further contends that pulse modulator 24 of Rees teaches or suggests Applicants' modulator. This contention is respectfully traversed because Applicants' modulator adds communication data to the laser beam whereas Rees modulator 24 is a pulse modulator that enables the tracking function required by the first embodiment of the Rees system due to the movement of the aircraft. Such a pulse modulator teaches away from a modulated laser beam that carries communication data. Specifically, the fact that the Rees laser beam is aimed forwardly of an aircraft or into air at an airport removes any incentive to modulate such atmosphere-probing laser beam with communication data.

The Office also asserts that the laser beam of the Rees system is aimed at trees, buildings, clouds, atmospheric aerosols and the like. However, the Rees laser beam is not aimed at buildings or trees, nor is it aimed at anything in particular. In the first embodiment, it is simply aimed forwardly relative to the path of travel of the aircraft and if a weather disturbance or wake vortex just happens to be in said path, then the laser beam reflects therefrom and follows a

straight path of travel back to the aircraft. If no such condition lies forwardly of the aircraft within the range of the laser beam, the laser beam does not reflect back to the aircraft. In the second embodiment, the laser beam is aimed in a direction determined by ground personnel but it is not aimed at buildings, trees, or any particular cloud or patch of atmospheric aerosols. In both embodiments, no attempt is made to aim the laser beam so that it bounces from something so that it can follow a "V"-shaped path of travel to a remote detector that is out of line of sight relation to the transmitter. The transmitter and receiver are both in an airplane fuselage or an airport building so the Rees system absolutely requires a straight out and a straight in return trip for its laser beam.

Regarding claims 6, 18, and 19, the Office contends that the first and second data communication devices of Rees are not in line of sight relation to one another, arguing as before that receiver 87 lies on a different plane than laser 12 as depicted in Fig. 3. Receiver 87 is the CCD, as pointed by Applicant above, that is inside an aircraft or an airport building so it matters not whether or not it lies in the plane of the laser 12 because the laser beam has already completed its straight out and straight back path of travel by the time said beam is diverted to the CCD as a part of the electronic analysis of said beam.

The Office further argues that reference numeral 70 in Fig. 3 of Rees is a barrier means as claimed by Applicant. Barrier means 70, like charge coupled device 87, is positioned inside an aircraft or an airport building and therefore provides no barrier to the laser beam that in the first embodiment is projected from the front of the fuselage into the path of travel of the aircraft, either on its outgoing or incoming path of travel, if any, and which follows a straight line path of travel in the second embodiment as well.

Regarding claim 20, the Office again asserts that receiver 87 lies on a different plane than laser 12 and Applicant has already traversed that assertion in connection with other claim rejections. The Office further asserts that objects in the environment that reflect the laser beam of Rees are obstacles that prevent line-of-sight communication between the data transmitting device of Rees (and there is no such data transmitting device) and the data receiving device. However, as has been clearly shown, the Rees laser beam has no barriers in its outgoing straight line path or in its incoming straight line path. If the Rees laser beam encounters a weather disturbance or wake vortex, the laser beam is reflected on a straight line back to the aircraft so such weather

condition or wake vortex cannot possibly suggest a barrier means that prevents the laser beam from encountering such weather disturbance or wake vortex.

Regarding claim 21, Applicant acknowledges that electrical signal conditioners are well-known, although they were not heretofore positioned downstream of a data transmitter and upstream of a laser light source in the novel data communication system invented and claimed by Applicant. Claim 21 depends from independent claim 20, currently amended, and is therefore allowable as a matter of law upon allowance of said claim 20.

Regarding claim 22, Applicant acknowledges that electrical signal conditioners are well-known, although they were not heretofore positioned downstream of an optical detector and upstream of a data receiver in the novel data communication system invented and claimed by Applicant. Claim 22 depends from independent claim 20, currently amended, and is therefore allowable as a matter of law upon allowance of said claim 20.

Regarding claim 23, Applicant acknowledges that optical bandpass filters are well-known. Claim 23 depends from independent claim 20, currently amended, and is therefore allowable as a matter of law upon allowance of said claim 20.

Regarding claims 24 and 26, the Office argues that Rees teaches "multiple optical wavelengths (*i.e.* 16a-16c in Figure 3) for communication of different communication signals simultaneously when the same external remote target is used as a common target for multiple communication devices." Applicant respectfully traverses this finding of the Office for reasons already stated. Claims 24 and 26 depend from independent claim 20, currently amended, and are therefore allowable as a matter of law upon allowance of said claim 20.

Regarding claims 25 and 27, the Office argues that Rees teaches "multiple optical wavelengths (*i.e.* 16a-16c in Figure 3) for communication of different communication signals simultaneously when the same external remote target is used as a common target for LIDAR communication devices (*i.e.* a laser)." Rees teaches away from the art of optical communication devices that have barriers preventing line-of-sight communication between such devices. Therefore, claims 25 and 27, which depend from independent claim 20, currently amended, are allowable as a matter of law upon allowance of said claim 20.

Regarding claims 30, 31, 32, and 33, the Office argues that the backscattered optical signal of Rees is detected simultaneously by multiple telescope receivers positioned at different locations, as depicted in Figs. 2 and 3 of Rees. However, those receivers are not positioned at

different locations; they are inside an aircraft or airport building at the same location as the transmitter. Of course two objects cannot occupy the same space at the same time but they certainly do not suggest Applicant's deployment of multiple telescope receivers that really are positioned in different locations remote from the transmitters and not bundled together inside an aircraft fuselage or airport building. Claims 30, 31, 32, and 33 depend from independent claim 20, currently amended, are allowable as a matter of law upon allowance of said claim 20.

Regarding claim 36, said claim depends from claim 1 and is allowable as a matter of law upon allowance of said claim 1, currently amended. Moreover, Rees does not teach a plurality of external remote targets in non line-of-sight relation to a detector. As has been clearly established, Rees' system relies entirely on a clear line-of-sight between the Rees laser transmitter and the weather disturbances or wake vortices that may lie in the path of travel of the aircraft. Any barrier between telescope 74 of Rees and any probe volume 16 renders the Rees system inoperable. Applicant employs two (2) telescopes so that a barrier that prevents line-of-sight communication between said telescopes does not prevent a transmitter telescope from using an object in the external environment as a reflector so that a transmitted beam may reflect from such object and arrive at said receiver telescope.

No prior art reference of record teaches or suggests a laser or LIDAR for generating and transmitting an external beam that is reflected from atmospheric particles, broadly known as aerosols, or against trees, buildings, or other natural or man-made objects remote from the coherent light source so that a communications signal is detected simultaneously by multiple remote telescope receivers positioned at different locations that are not in line-of-site relation to the transmitter. In fairness to Applicant, it must be acknowledged that the Rees straight line path of travel having no intervening barrier in said path of travel teaches away from the invention as claimed.

In Applicant's system, as claimed, the use of two different targets such as a tree and a building separates two different communications channels from one another, and provides security from cross-talk between the two channels because different spatial targets are used, *i.e.*, the tree and the building occupy different spaces. These significant aspects of the invention are recited in the appropriate independent claims as currently amended. The Rees sound-detecting system does not suggest communication channels at all, much less separate communication channels that suppress cross-talk.

Applicant is the first, anywhere in the world, to provide a communication device for transmitting modulated data communication signals to a receiver, where the transmitter and receiver are out of line-of-sight relation to one another, that includes at least one laser adapted to simultaneously generate coherent light at multiple wavelengths, at least one detector adapted to detect the coherent light at multiple wavelengths, and a plurality of external remote targets and target spatial regions fixed in line-of-sight relation to the laser and in line-of-sight relation to the detector where the external remote targets and target spatial regions are trees, buildings, clouds, atmospheric aerosols, and like objects that are out-of-doors relative to the laser. Applicant's first-in-the-world system further includes a modulating device connected in modulating relation to the laser and the modulating device is adapted to modulate each of the multiple wavelengths so that multiple messages are transmitted. The novel communication device is adapted to aim the modulated light from the at least one fixed position laser at the plurality of external remote fixed position targets and target spatial regions to separate spatially different communication optical signals from one another. The at least one fixed position detector is adapted to demodulate light scattered by the target and includes an optical bandpass filter adapted to pass preselected wavelengths of light and reject wavelengths of light outside of the preselected wavelengths. Multiple messages are therefore transmitted along multiple wavelengths and the multiple messages are individually detected by the at least one detector, all as recited in claim 1 as currently amended. No fair characterization of Rees teaches or suggests such invention.

Response to Arguments

4. Applicant thanks the Office for fully considering the arguments filed 05/28/2008.

5. The Office helpfully points out that Applicant's use of multiple wavelengths at multiple frequencies are not recited in the rejected claims. Applicant has therefore carefully amended the independent claims 1 to include this limitation so that the independent claims positively recite Applicants' contribution without also reciting the contribution of Rees. This additional limitation further places said claims as currently amended in condition for allowance. However, the most important feature of Applicant's invention is clearly the ability to transmit communication data between a transmitter and a receiver that are out of line-of-sight relation to one another due to a barrier between said transmitter and receiver. Rees' straight path of travel system having no barrier does not even come close to suggesting Applicant's invention as currently claimed. Applicant apologizes for not pointing out this fundamental distinction

between Rees and Applicant's respective contributions in earlier communications and can only offer the excuse that earlier communications were overly focused on relatively inconsequential minutia, thereby overlooking the big picture that renders the claimed invention clearly and unquestionably patentable over the Rees invention.

The Office further helpfully points out that Applicants' separate transmitting and receiving telescopes are not clearly recited in the rejected claims. Accordingly, Applicants have carefully amended independent claims 1, 6, 18, and 20 so that said claims as currently amended positively recite Applicants' separate transmitting and receiving telescopes. This further limitation further places the independent claims in condition for allowance.

Conclusion

A Notice of Allowance is solicited. If the Office is not fully persuaded as to the merits of Applicant's position, or if an Examiner's Amendment would place the pending claims in condition for allowance, a telephone call to the undersigned at (813) 925-8505 is requested. Applicant thanks the Office for its continuing careful examination of this important patent application.

Very respectfully,

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CERTIFICATE OF ELECTRONIC TRANSMISSION
(37 C.F.R. 2.190(b)

I HEREBY CERTIFY that this Amendment E, including Introductory Comments, Amendments to the Claims, and Remarks, is being electronically transmitted to the United States Patent and Trademark Office through EFS Web on September 12, 2008.

Dated: September 12, 2008

/jessica powell/
Jessica Powell